

Philip S. Callahan, Brian D. Wilson, Zhangfan Xing, Rob Raskin & Kenneth Oslund

Jet Propulsion Laboratory, California Institute of Technology

Copyright 2010, California Institute of Technology. Government sponsorship is acknowledged. This work was supported by the NASA ACCESS program.

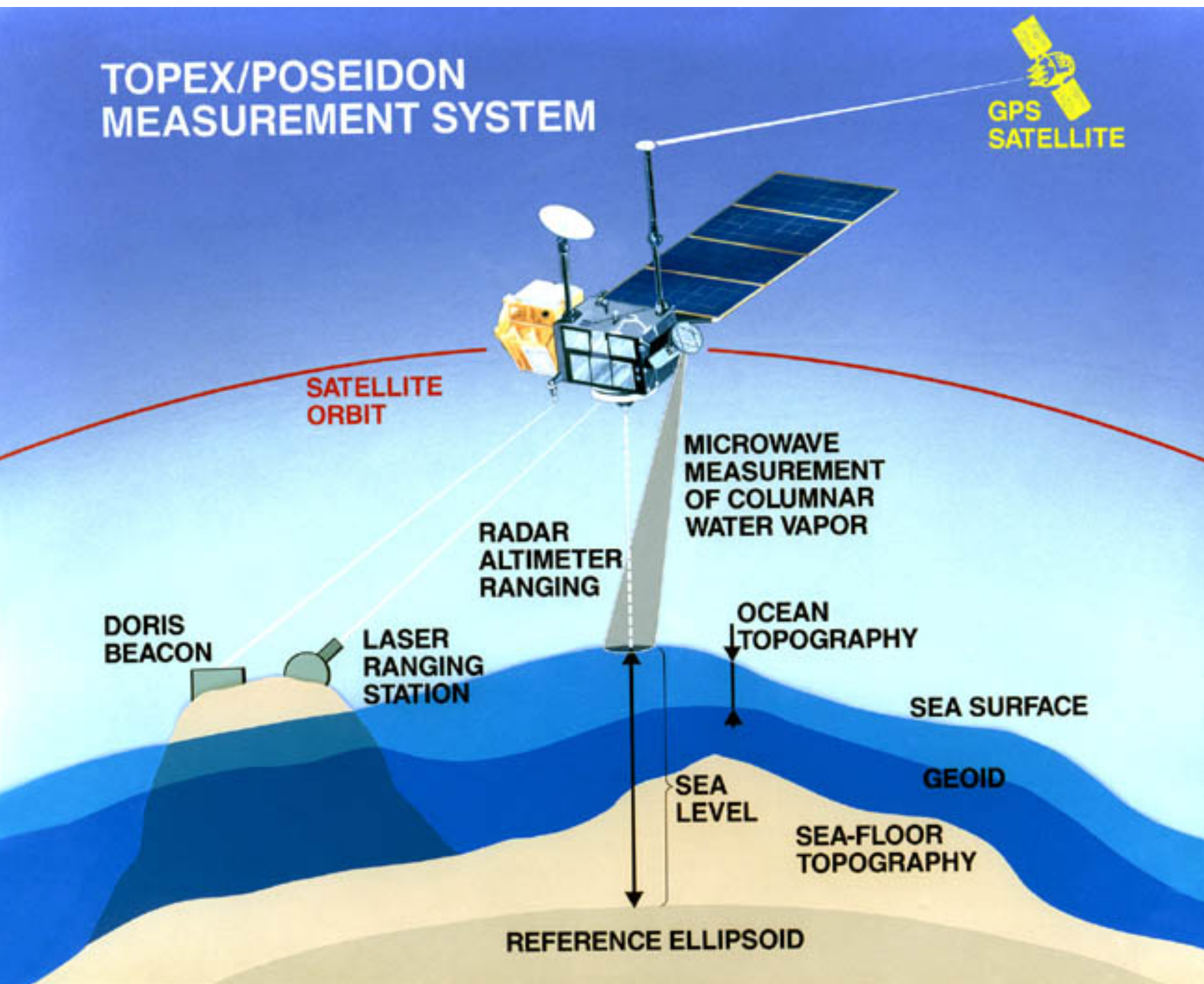
Abstract

We are developing a web-based system to allow updating and subsetting of TOPEX data in netCDF. The Altimeter Service will be operated by PODAAC along with their provision of oceanographic data. The Service can be easily expanded to other altimeter data in netCDF. An Altimeter Service is crucial to the improvement and expanded use of altimeter data. A service is necessary for altimetry because the result of most interest (sea surface height anomaly, SSHA) is composed of several components which are updated individually and irregularly by specialized experts. This makes it difficult for projects to provide the most up-to-date products. Some components are the subject of ongoing research, so the ability for investigators to make products for comparison or sharing is important. The service will allow investigators/producers to get their component models or processing into widespread use much more quickly. For coastal altimetry, the ability to subset the data to the area of interest and insert specialized models or data processing results is crucial.

A key part of the Altimeter Service is having data producers provide updated or local models and data. In order for this to succeed, producers need to provide their products to the Altimeter Service in a form consistent with the service update methods. The currently available update methods include: interpolation of standard GSFC orbits, GOT tides, point-by-point replacement, gridded field interpolation. Other tide models will be added.

The capabilities of the web service are shown including features applicable to all netCDF data. A key feature of the Service is providing TOPEX GDRs with Retracking (RGDRs) in netCDF format that has been coordinated with Jason data. Users can add new orbits, tide models, geophysical fields such as mean sea surface, and along-track corrections as they become available and are installed by PODAAC. The updated fields are inserted into the netCDF files while the previous values are retained for comparison. The Service will also generate SSH and SSHA.

The research described here was carried out at the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Background

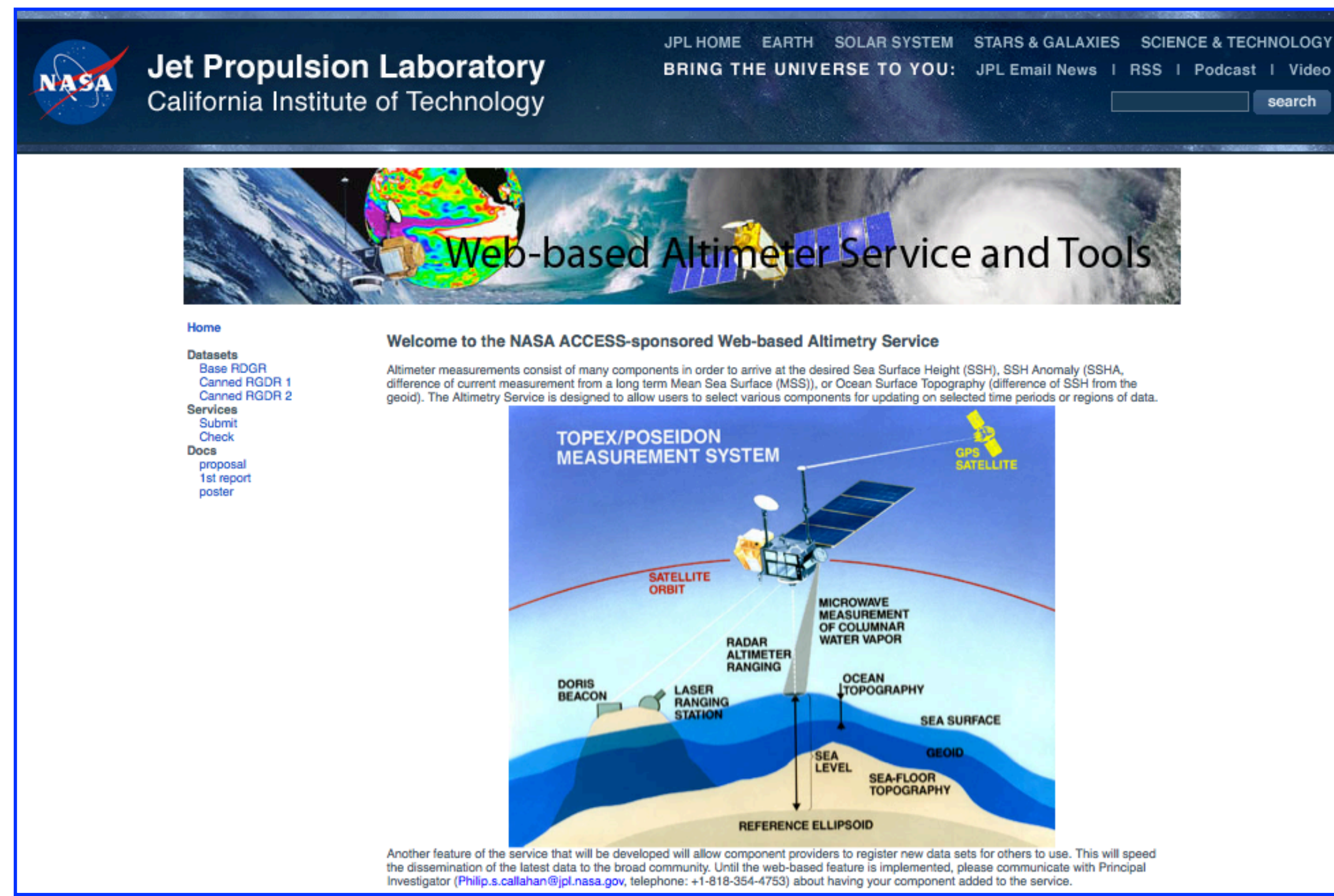
- An Altimeter Service is needed because:
- Altimeter data consist of several specialized “components” that are updated by different groups at irregular intervals
- Specialized data exist for localized areas
- Altimeter Sea Surface Height Measurement Components for Updating:
 - Orbit
 - Tides
 - Radiometer (point-by-point, reprocessed)
 - Atmospheric corrections – range, inverse barometer (point-by-point)
 - Mean Sea Surface, Geoid (gridded field)
 - Range processing, corrections – retracking, Sea State Bias (point-by-point)

Capabilities

- Base data set produced from RGDRs in netCDF as similar as possible to Jason. CF-compliant attributes
 - Can operate on any netCDF dataset by incorporating xml file
- Data Selection by
 - Cycle/pass range/list
 - Lat, Lon Region
- Select version of components for updating
- Select output file variables (planned). Current appends new field to field, retains original field
- Generates updated RGDR and separate file of Sea Surface Height (SSH) and SSH Anomaly (SSHA) based on both old (GDR) and new (Retrack plus updates) values with the key variables used to make them

Sample Screens

Home



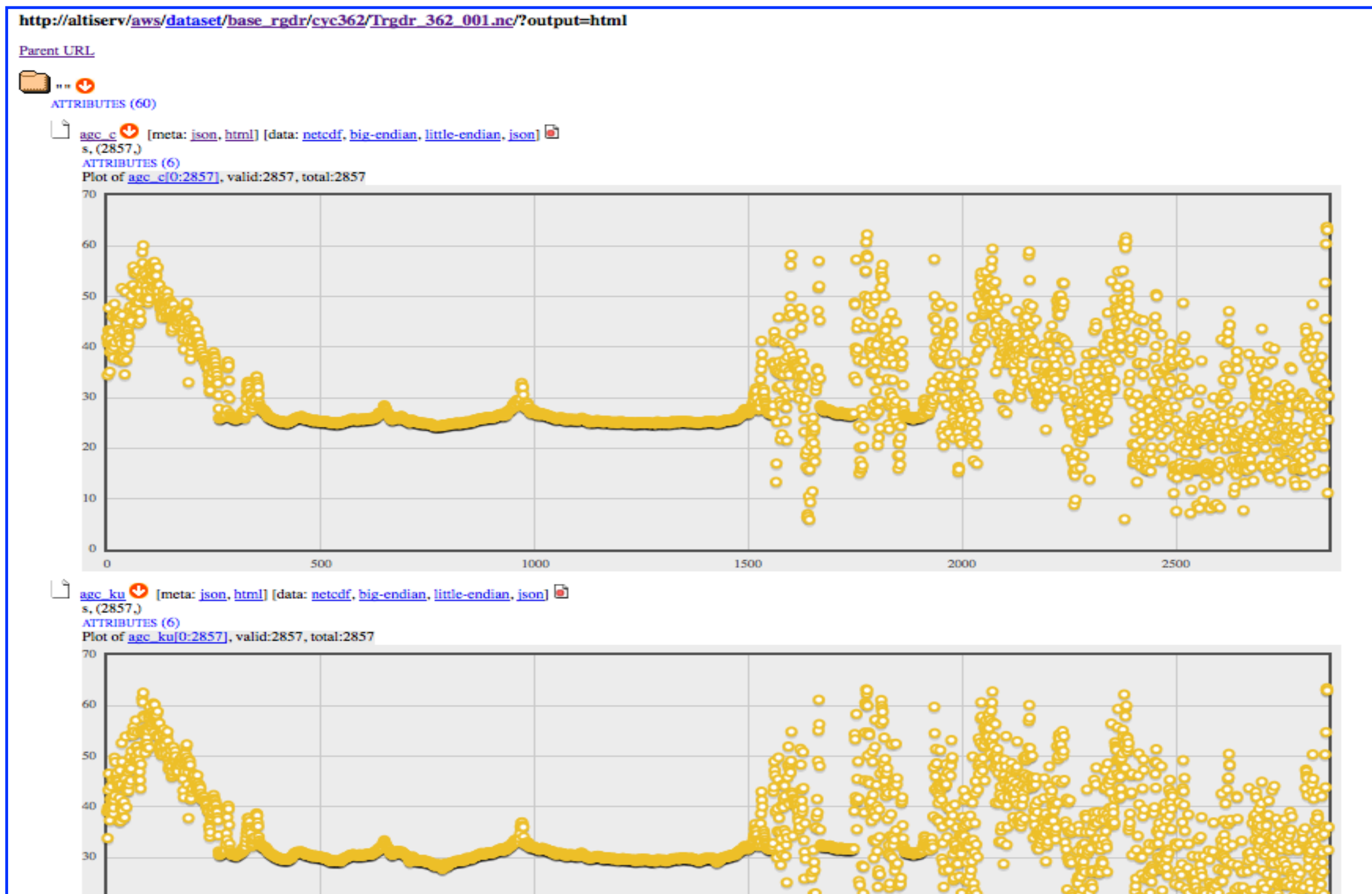
Datasets

Index of /aws/dataset/					
	Name	Last modified	Size	Description	Webifiable
Parent Directory					
	base_rgdr/	2010-08-27 16:30:40	-		
	base_rgdr_old/	2009-08-06 09:42:17	-		

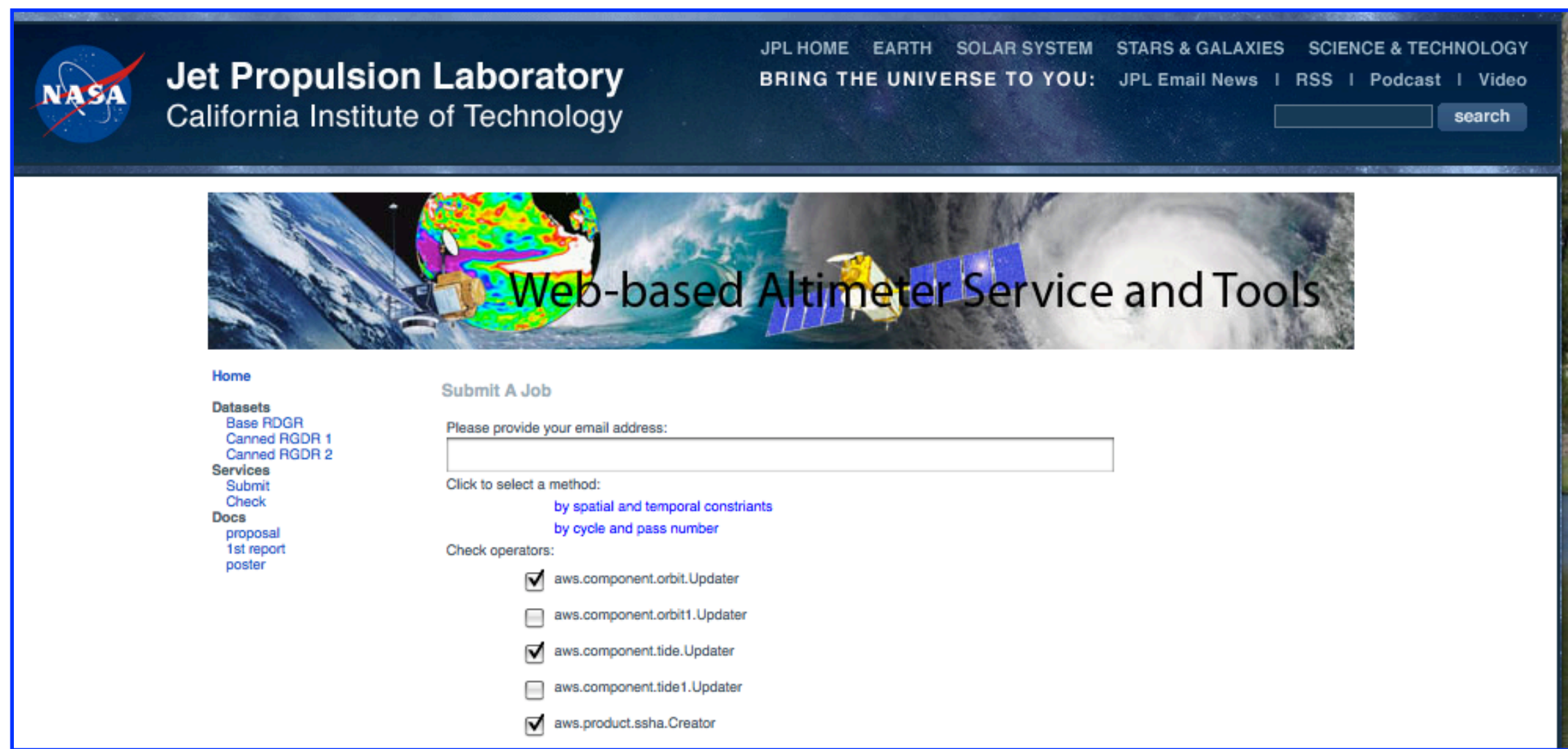
application:pomegranate-2.0.3, spec:draft-2009/12/28

Index of /aws/dataset/base_rgdr/cyc362/					
	Name	Last modified	Size	Description	Webifiable
Parent Directory					
	Trcdr_362_001.nc	2010-08-27 16:54:09	1293324		
	Trcdr_362_001_ssh.nc	2010-09-01 12:09:36	326128		
	Trcdr_362_002.nc	2010-08-27 16:54:10	1295856		
	Trcdr_362_002_ssh.nc	2010-09-01 12:09:37	326796		
	Trcdr_362_003.nc	2010-08-27 16:54:12	1304696		
	Trcdr_362_003_ssh.nc	2010-09-01 12:09:38	329124		
	Trcdr_362_004.nc	2010-08-27 16:54:13	1377272		
	Trcdr_362_004_ssh.nc	2010-09-01 12:09:38	347940		
	Trcdr_362_005.nc	2010-08-27 16:54:14	1313136		
	Trcdr_362_005_ssh.nc	2010-09-01 12:09:39	331276		

Both RGDRs and SSH/A files are in netCDF



Submit



- User enters email to send link to results, selects updates to do.
- Click on links for data subsetting: Cycle/Pass or Space/Time.
- When all selections are made, a job is submitted on the server. When the job is completed, an email is sent to the user with a link to retrieve the data.

- Data can be viewed through a browser as shown below.

Variables

```
http://altiserv/aws/dataset/base_rgdr/cyc362/Trcdr_362_001.nc?output=html
Parent URL:
ATTRIBUTES (60)
  [1] ssc_e [meta: json, html] [data: netcdf, big-endian, little-endian, json]
  s, (2857)
  ATTRIBUTES (6)
  [1] ssc_ku [meta: json, html] [data: netcdf, big-endian, little-endian, json]
  s, (2857)
  ATTRIBUTES (6)
  [1] ssc_normal_ku [meta: json, html] [data: netcdf, big-endian, little-endian, json]
  1, (2857)
  ATTRIBUTES (6)
  [1] ssc_rms_e [meta: json, html] [data: netcdf, big-endian, little-endian, json]
  s, (2857)
  ATTRIBUTES (6)
  _FillValue: [32767]
  comment: Compression of C-band high rate elements is preceded by a detection of ou ... [more]
  coordinates: lon lat
  long_name: RMS of the C band AGC
  scale_factor: [ 0.01]
  units: dB
  [1] ssc_rms_ku [meta: json, html] [data: netcdf, big-endian, little-endian, json]
  s, (2857)
  ATTRIBUTES (6)
  _FillValue: [32767]
  comment: Compression of Ku-band high rate elements is preceded by a detection of o ... [more]
  coordinates: lon lat
  long_name: RMS of the Ku band AGC
  scale_factor: [ 0.01]
  units: dB
  [1] ssc_hsd_1 [meta: json, html] [data: netcdf, big-endian, little-endian, json]
  1, (2857)
  ATTRIBUTES (4)
  _FillValue: [127]
  comment: See MGRD User Handbook. Packed bits of altimeter correction quality.
  coordinates: lon lat
  long_name: altimeter measurement quality byte 1
```

↑ User can see any variable in netCDF file. Attributes can be opened. Various views of the data are available. Download options (endian, netcdf) can be chosen.

← “webification” (work of Zhangfan Xing) provides a plugin to plot any netcdf variable.